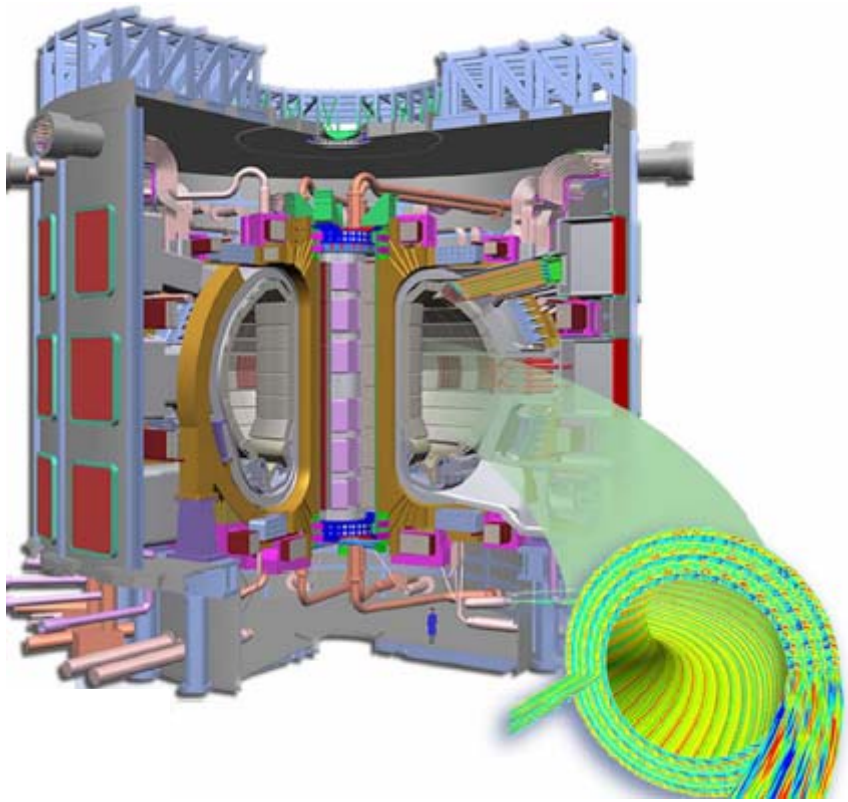
LLNL and ITER: An Institutional Perspective



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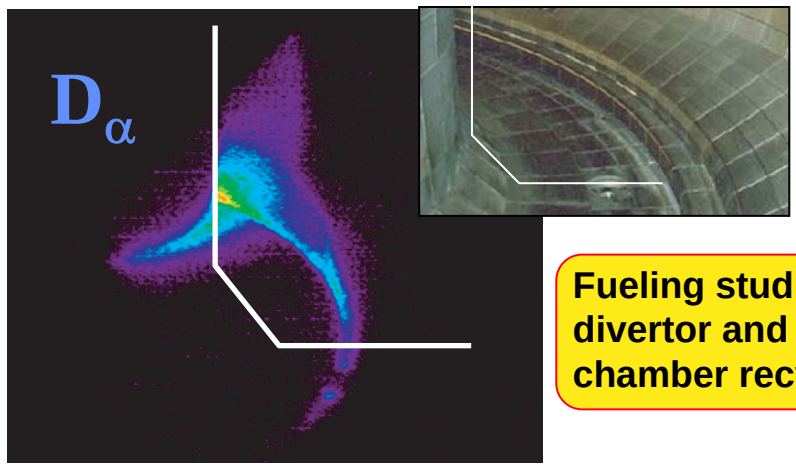
The Fusion Energy Program at Livermore is well positioned to support US participation in ITER

- **The LLNL Magnetic fusion group has been a strong advocate for burning plasma research**
- **We have shifted program resources to further emphasize physics areas important to burning-plasmas**
  - **Our DIII-D team is focused on ITER-relevant research**
  - **The LLNL Theory group is placing increased emphasis on boundary physics important for ITER**
- **Laboratory senior management continues its strong support of the Fusion Energy Program.**
  - **The Fusion Program obtained funding for an an advanced edge modeling initiative focusing on the pedestal, one of only two new Strategic Initiatives to be funded in FY04 as an outcome of an LLNL-wide strategic planning effort**
  - **Most recently, the LLNL director took a strong personal interest in developing a proposal for the US ITER Project Office**

Our DIII-D team is focused on ITER-relevant research

- LLNL leads the pedestal physics thrust area on DIII-D, an area crucial to ITER performance.
- Divertor measurements provide valuable insight for managing plasma-wall interactions and tritium exhaust, a topic that will be central to ITER operations.
- The proposed Divertor CER diagnostic will provide detailed measurement of plasma flow, information which is crucial for understanding tritium retention, another topic that will be central to cost effective ITER operation.
- The LLNL state-of-the-art MSE system for the AT Program is well-matched to US interests for ITER diagnostics.

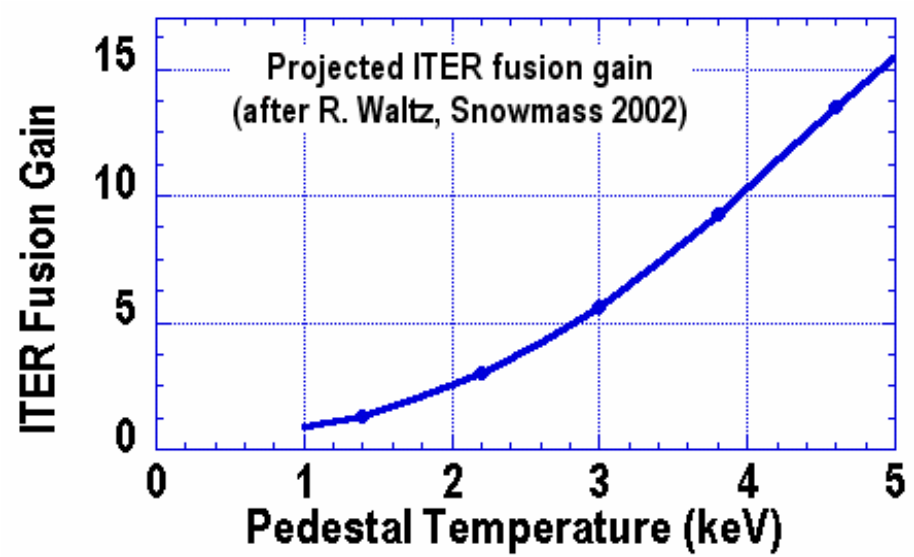
The LLNL FEP has been a key partner DIII-D program since 1986. This program is an outstanding model of multi-institutional scientific collaboration that will be a central to success on ITER.

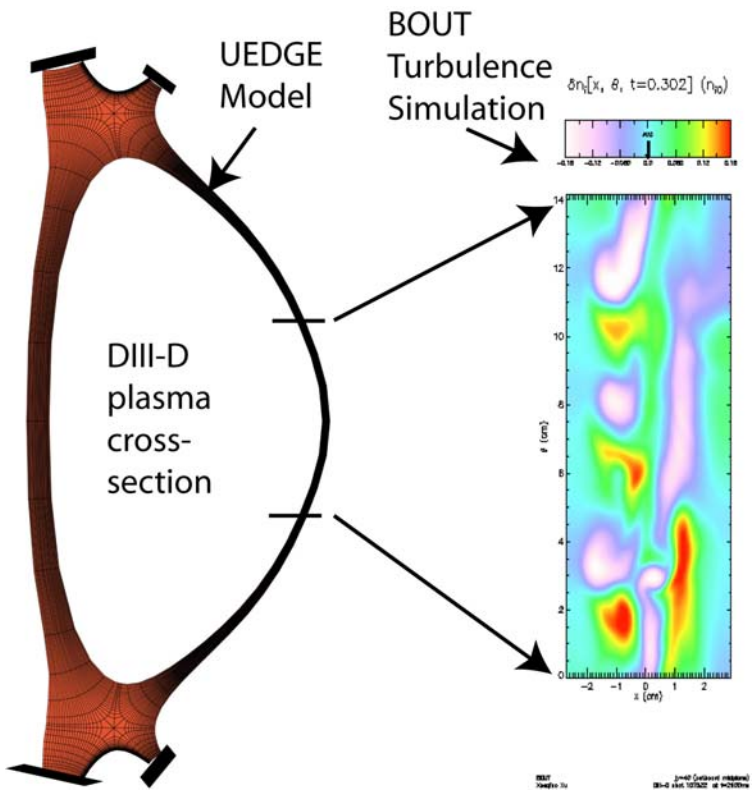


Fueling studies show divertor and main chamber recycling

The LLNL Theory group is placing increased emphasis on boundary physics important for ITER and burning plasma science

- LLNL is investing significant resources to simulate the tokamak edge pedestal, a key to predicting ITER performance
  - Bill Nevins is leading a $1M/yr 3yr Strategic Initiative involving multiple Directorates at the Lab
  - Goal: develop computational tools and physics models for a self-consistent kinetic model
  - One of only two new Laboratory Strategic Investments of LDRD funds for FY04.
  - Valuable preparation for the Fusion Simulation Project
- In parallel, the Laboratory is supporting an effort by Rognlien and Xu to couple BOUT and UEDGE.
- We have built a multi-institutional partnership to submit a SciDAC proposal focused on edge turbulence.





Livermore management is firmly committed to magnetic fusion and LLNL participation in the ITER project

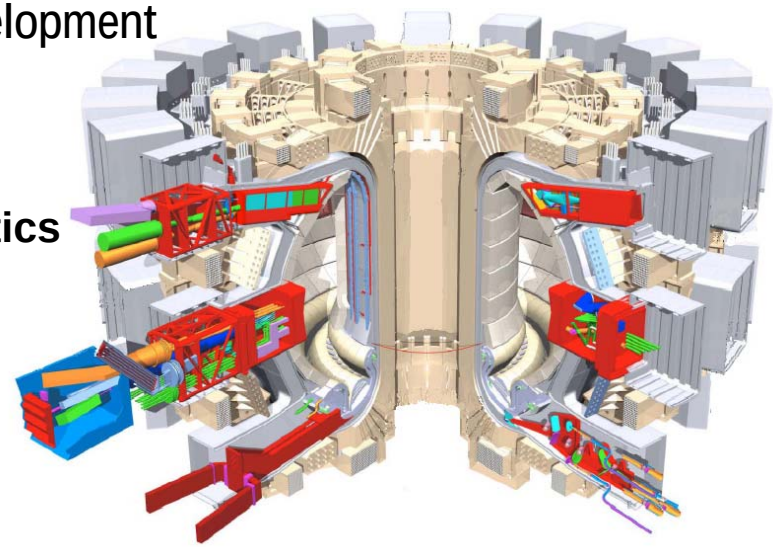
- LLNL, including the director's office, views ITER as an opportunity to strengthen its commitment to magnetic fusion, and contribute as a voice in representing magnetic fusion to the nation.
  - LLNL is a fusion laboratory with strong roots in both MFE and IFE
  - Project Sherwood (the MFE program) was one of the first missions of LLNL when it was established in 1952 and LLNL remains strongly committed to the success of fusion energy
- LLNL is committed to supporting multi-national unclassified research like fusion
  - A proposed International Science & Technology center would be located outside the “fence”
  - If the LLNL proposal is chosen, the US ITER Project Office would become a major focus of this IS&T center
- LLNL involvement in ITER has strong backing from the full range of Laboratory management:
  - Lab Director had a strong personal involvement in the LNNL ITER Project Office Proposal.
  - Strong support from the UC (President Robert Dynes)
  - NNSA (Linton Brooks) fully supportive of Livermore participation in ITER

Areas where the LLNL Fusion Energy Program can play an important role in the ITER project

- Hosting the Project Office
- Procurement of the Central Solenoid magnet
- Diagnostic development
  - Diagnostic port integration facility
  - Individual instruments: MSE and divertor or PFC-related diagnostics
- West-coast remote experimental site (building on earlier work with C-mod & DIII-D)
- Integrated predictive simulation and scenario development

ITER diagnostics

ITER port assembly



Testing the CS Model Coil